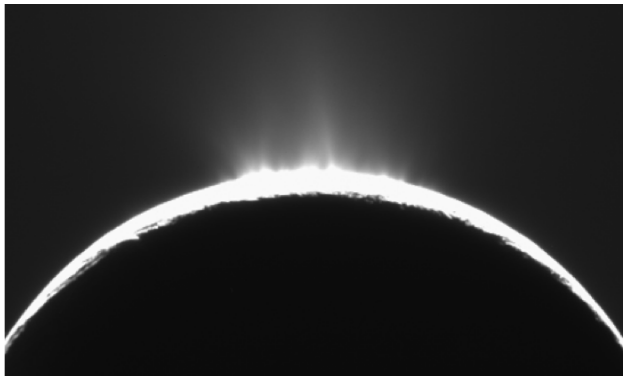
SOST Plume PIE Observations (recap)

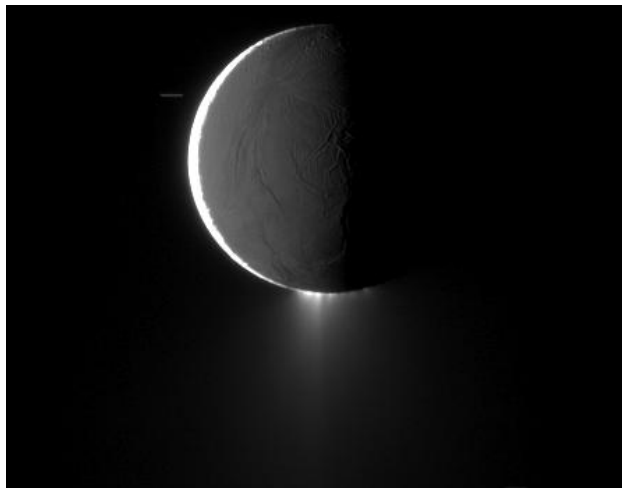
Why so many plume observations?

1. **To obtain different viewing geometries which better characterize plume morphology, particle size, and the relationship between plumes and surface features and thermal anomalies. Specific jets are mapped to specific locations. In addition, large distances are required for context and to understand the relationship of the plumes to E-ring.**

2. **To understand the variability of geologic activity on Enceladus. The same viewing conditions at different times are required.**

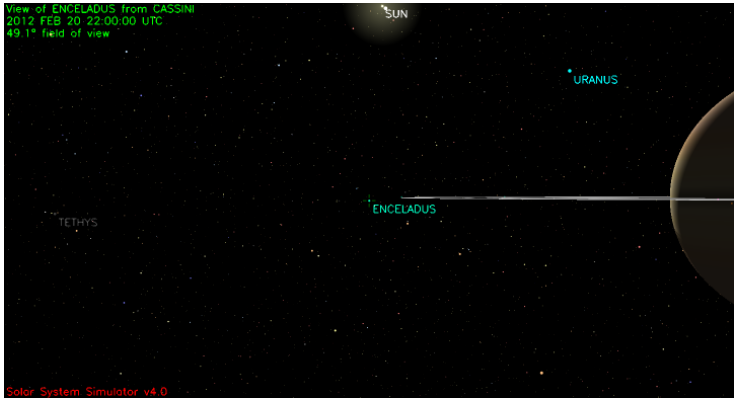
3. **Observations of both jets and plumes are required.**



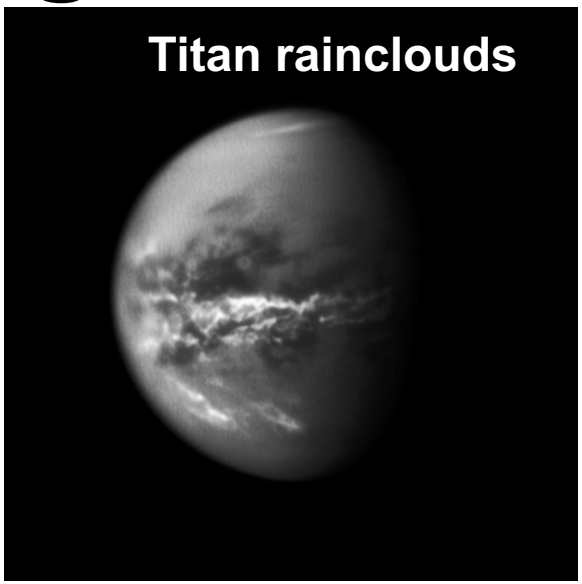


Plume PIE observation summaries: Revs 161-162

Segment/Type	Time	Description	Purpose
MAG_161_162 (JET)	2012-051T17:45:00 - 051T20:35:00	High phase med res	Context of jets; particle sizes
MAG_161_162 (JET)	2012-051T21:00:00 - 052T00:50:00	High phase high res	Location of jets; particle sizes



Rev 162 SOST Segment



2012-068T20:01:00-071T06:01:00

No targeted flybys

Highlights:

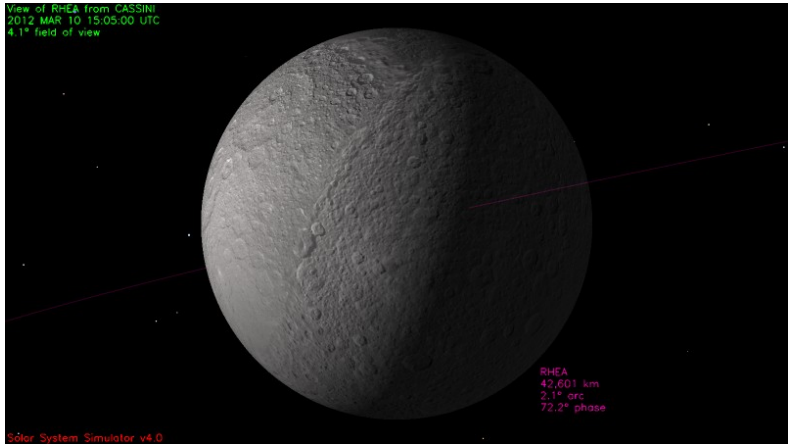
19+hr ISS observations of outer irregular moons Jarnsaxa and Mundilfari to derive rotation rate and physical properties.

Two Titan cloud monitor observations, at 069:T15:51 (2 hours) and at 070:T08:15 (1:30 hour) to observe the development of cloud patterns in Titan's atmosphere through northern spring and summer. Rainfall is also being monitored.

Enceladus 070:06:30 (1:45 hr) ORS observation; low-phase mapping (168K C/A; 9180 earlier, but OTM downlink)

Rhea CIRS observation 070:T10:25 (04:35 duration), then ISS/VIMS 1:30 hour mosaic; C/A 42K at 15:03

Rhea ring search at end (01:55 hours)



Rhea near C/A at 070:T15:05

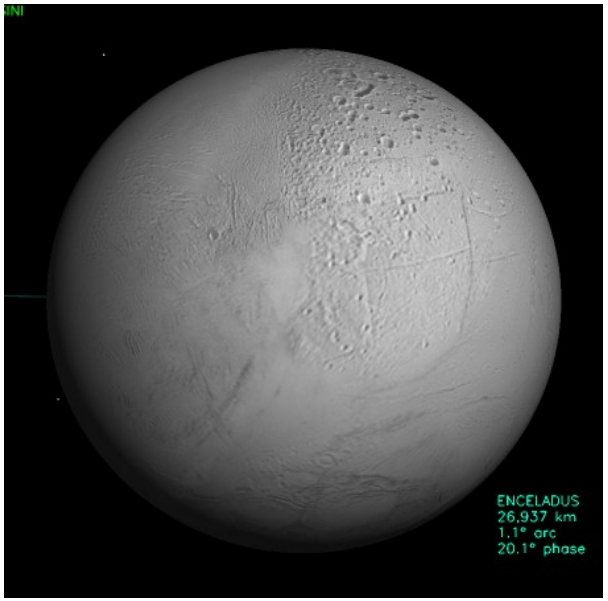
E17: Rev 163

2012-87T18:30:08.56
(27 Mar 2012) 77.9 km

MAPS (INMS) prime to study the composition, density, and variability of plumes; with E14 and E18 provides good coverage of S. polar regions.

Other highlights: during dark approach, CIRS will be observing to monitor hot spots, and during the lit exit, ISS will be prime with ORS ridealongs.

The dark approach is also an ideal time for another plume observation. There is a long (5 hour) observation at 087T0:45 at a solar phase angle ranging from 154º to 160º. This wide range in solar phase angles will enable a good measurement of the forward scattered solar phase function of the particles, which in turn can be used to derive their sizes. Time variability of the plume can also be studied.



Enceladus at the start of the ISS observation after closest approach

E17 segment: other highlights

2012-086T18:47-089T:18:32

The segment starts with the first of a pair of Titan cloud monitoring campaign observations at 086T19:27, with the other one at 088T21:12, enabling study of cloud evolution over periods of days. There is also a pair of ISS observations searching for Lagranian satellites in the L5 points of Titan and Rhea.

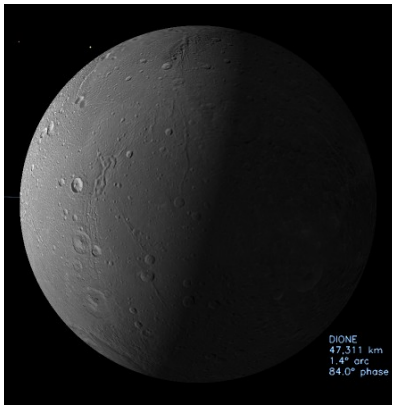
A Janus observation at 087T21:10 (03:40 hr duration), with a closest approach of 44K km, the best yet.

A Radar scatterometry measurement of Dione at 088T01:30-04:30 complements the observations of other icy moons and Titan, enabling comparisons. This is followed by an ORS regmap of Dione (right).

There is a short (45 minute) CIRS observation of Rhea (to complete coverage) at 089T02:15 and an ISS calibration on Rhea after that.

Finally, Radar executes an engineering test on Saturn at the end of the segment.

Janus at 75,000 km – the best so far, on April 7, 2010



Dione at the start of the ORS Regmap at 088T04:30 (03:44 duration)